

Research Reports on

Tobacco and Health

Vol. 4 No. 3

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Review of Lung Cancer Literature Concludes Causes Are Not Known

After reviewing the literature on lung cancer from 1930 to 1960, with 455 references, two Texas scientists reached this conclusion:

"Obviously from this review it is evident that the etiology and the pathogenesis of pulmonary cancer in man is not known."

The 49-page review cites studies questioning whether lung cancer incidence is actually increasing, and, if so, to what extent.

Dr. R. H. Rigdon and Helen Kirchhoff, of the pathology department of The University of Texas Medical Branch at Galveston, said "more has been written about it (lung cancer) in the scientific literature and the lay press" than any other cancer.

The review covers various factors

*"Cancer of the lung 1930 to 1960: A review." *Texas Reports on Biology and Medicine*, Fall 1961.

Study Links Pulmonary TB To Lung Cancer Causation

Pulmonary tuberculosis may have a causal effect on lung cancer, reports an Australian chest specialist in a review of 6,502 war veterans with tuberculosis.*

Among the veterans, 34 lung cancer deaths occurred instead of the 13 deaths that would be expected in a population of that size, according to Dr. Alastair H. Campbell, senior specialist in chest diseases for Australia's Repatriation Department. He called this ratio "highly significant." There were 858 deaths from all causes during the review, which covered periods between 1948 and 1959.

(Continued on page 4)

*The association of lung cancer and tuberculosis. *Australian Annals of Medicine*, May 1961.

that have been studied, including tuberculosis, influenza and other chest ailments, occupational exposures, atmospheric pollutants, and tobacco.

In a section on tobacco, the researchers said the hypothesis that smoking causes lung cancer is based largely on statistical studies that vary widely in reported findings.

"Since smoking is such a common habit and lung cancer is relatively infrequent in those who smoke, there must be some as yet unknown factors that enter into this mechanism," they said.

They referred to their own 1958 study of some 12,000 individuals which found that the 97.2 percent of the white males who had smoked for 16 years or longer did not have lung cancer according to the medical record at the time they were surveyed.

While there have been correlations between recorded deaths from lung

(Continued on page 4)

Heart Study Covers Four Characteristics

Because of recent reports indicating that executives and professional people may be less susceptible to heart disease than other employed persons, two scientists studied 1,585 men to find an explanation.*

They compared executive and non-executive personnel for four characteristics that have been associated with heart disease: blood pressure, body weight, serum cholesterol and smoking habits.

(Continued on page 4)

*"Blood pressure, body weight, serum cholesterol, and smoking habits among executives and nonexecutives." *Journal of Occupational Medicine*, October 1961.

Statistics on Smoking

Conflicting Theories Heard At International Meeting

Conflicting theories about the reported statistical link between smoking and lung cancer and other diseases were discussed by several scientists at the International Statistical Institute meeting in Paris, France, in September.

Speakers included: Dr. Joseph Berkson, chief of the Mayo Clinic's section of biometry and medical statistics; Dr. Geoffrey Dean, senior honorary physician, Provincial Hospital, Port Elizabeth, South Africa; Dr. E. Cuyler Hammond, director of the statistical research section, American Cancer Society, and Dr. Harold L. Stewart, chief, laboratory of pathology, National Cancer Institute. Dr. Berkson was program organizer for the I.S.I. session on smoking and lung cancer and associated questions.

Dr. Berkson challenged those statisticians who, by observing statistical associations, claim to have discovered the causes of "diseases that have defied the best efforts of the greatest biologic investigators for generations."

"It will be a quite sufficient contribution of statistics if it locates suggestions for the general biologist, pathologist, biochemist and other physical scientists to investigate and decide upon with due regard for and in accordance with the established canons of science," Dr. Berkson said.

Animal Tests Negative

Dr. Stewart reviewed laboratory experiments with tobacco and animals and reported that years of experimentation had failed to induce pulmonary cancers in laboratory animals by exposure to inhalation of cigarette smoke.

Dr. Dean reported on his continuing study of the comparative mortality between native-born South African whites and white immigrants. He said the genetic stock in South Africa

(Continued on page 3)

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British Pathologist Interviewed . . .

Cunningham Gives Lung Cancer Views

Dr. George J. Cunningham, the British pathologist, discussed several questions on lung cancer in a recent interview with a medical journal.* He is professor of pathology, Royal College of Surgeons of England.

Here are some of the questions and Dr. Cunningham's answers:

"What is your opinion about the relationship between lung cancer and cigarette smoking?"

"Considerable statistical evidence has accumulated for the relationship of cigarette smoking to lung cancer. There is, however, little confirmation of the statistical evidence in experimental studies. Tumors have been induced on the skin of animals by painting of the skin with extracts of tobacco tar. But, nobody, as yet, has consistently produced squamous cell carcinoma in the lungs of animals with extracts of tobacco. Some bronchial adenomas have been induced, but this kind of lesion can arise spontaneously. Squamous cell carcinoma is the acute problem in lung cancer.

"In studies of the bronchial epithelium, various changes which might precede cancer have been described in the lungs of normal persons. In particular, basal cell hyperplasia has been mentioned. According to statistical evidence, this condition occurs most frequently in the lungs of persons who smoke. The condition is found not only in those who smoke, however, and can be produced by such other causes as persistent severe infection. It would be wrong, I think, to deny that cigarette smoking might be an etiological factor in lung cancer, but that cigarette smoke is the factor is certainly questionable."

"What have you found in your own studies of the etiological factors in bronchogenic carcinoma?"

"In our own experiments, we have found indications that, in certain abnormal epithelium, the biochemical content differs from that of normal epithelium. Possibly, these changes might facilitate absorption of carcinogenic substances in inhaled air.

"As a practical measure in early detection, which patients should be observed closely?"

"All male patients over 40 years

*An interview with George J. Cunningham. *The Cancer Bulletin*, The University of Texas, M. D. Anderson Hospital and Tumor Institute, September-October 1961.

of age should be regularly examined. Probably, the need for frequent examination of those who smoke should be emphasized. But, there are other groups of patients who also should receive particular attention. Some persons seem especially susceptible to infectious diseases of the lungs. They are often slow to recover after an illness of this kind. Some patients smoke only a few cigarettes each day and still develop a cough. Others who smoke a comparatively large number are not affected. The point I make is that we should not focus our attention on those who smoke so that we overlook the possibility of lung cancer in other patients. In this kind of cancer, early detection is especially important."

LUNG CANCER

"Currently, it is the fashion to attribute a strong relationship to cigarette smoking, with the implication that cessation of smoking would be followed by a steadily decreasing incidence of the disease in the generations to follow. Many investigators, however, retain sincere doubts as to the cause and effect relationship between cigarette smoking and the development of lung cancer."

"Studies in South Africa, New Zealand and the United States on the difference in incidence between native-born and immigrant populations have been most stimulating in turning attention toward the role of air pollution and other environmental factors . . .

"Once suspect and then apparently cleared, the internal combustion engine is again under scrutiny as the result of research on the problem of smog . . . Recent work would tend to indicate that we are possibly dealing with a virus as the primary etiologic agent and that a combination of factors previously discussed may predispose in the development of, or relative resistance to, the disease."

*From "Carcinoma of the lung," Dr. Raymond J. Barrett, College of Medicine, Wayne State University, Detroit. *Journal of the Michigan State Medical Society*, June 1961.

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Study Questions Data On Bronchial Cancer

After surveying 278 "well-diagnosed" cases of bronchial carcinoma, a Dutch physician says that correct diagnosis of the disease has been possible only in relatively recent years, with much of the improvement in methods and equipment occurring since World War II.*

"It is clear that data about carcinoma of the bronchus which came to us before about 1950 cannot be very reliable, firstly because diagnostic possibilities were not so good and secondly because of the remarkably increased expectation of life," wrote Dr. B. K. S. Dijkstra of the State University of Groningen, The Netherlands. "In earlier days many people did not reach the age when carcinoma is likely to develop, whereas they do now."

Dr. Dijkstra grouped 268 cases according to soil conditions of their residence and found: 175 lived in dusty areas, 84 in moderately dusty areas, and 9 in damp areas where there was stream sediment or peat bog soils.

"We can say from these data that the more dusty the ground, the more lung cancers are to be found; the wetter the ground, the fewer we see," he said.

Dr. Dijkstra also noted a marked family occurrence of lung cancer. He reported a case of two brothers, another of five brothers, and a further two and probably three cases of identical twins with bronchial carcinoma.

Tracing the occupational histories of 242 cases, he found no one working in the tobacco industry or as a seaman who had lung cancer. He said both groups contain heavy smokers because of duty-free or free cigarettes.

*"Carcinoma of the bronchus. A survey of 278 cases." *Practica Oto-Rhino-Laryngologica*, May 1961.

Conflicting Theories on Smoking Statistics

(Continued from page 1)

and Western Europe is much the same, yet South Africa's lung cancer incidence is less than half of England's—although South Africans have been the world's heaviest cigarette smokers for the last 40 years.

Air pollution is far more important than cigarette smoking in connection with lung cancer, he said, and "with no air pollution moderate cigarette smoking would appear to carry little danger."

Statistical Studies Reviewed

Dr. Hammond gave preliminary findings, based on 43,068 persons, of an American Cancer Society questionnaire study of 1,085,000 persons. He said mortality rates were 44 percent higher for smokers who said they inhaled "slightly," compared to those who never smoked, 77 percent higher for those who said they inhaled "moderately," and more than 100 percent higher for those who said they inhaled "deeply."

Dr. Hammond also reviewed several other statistical studies that indicated higher mortality rates among smokers.

Dr. Berkson in commenting on such studies, said: "Objective examination of the results of these investigations disclosed, however, that the death rate among smokers was greater not only from lung cancer, but also from all classes of disease other than lung cancer. . . . These complex findings posed, of course, a quite different scientific problem for explanation than was presented by the original question of whether smoking causes cancer of the lung. In previous papers I have suggested some possible explanations and some methods of investigating them, and in one of these I explain why I myself do not believe that smoking causes cancer of the lung. But the general public heard only about lung cancer. It is a notorious example of . . . the fallacy of misplaced concreteness."

Marital Status and Lung Cancer

Explaining how statistical associations can mislead, Dr. Berkson cited statistics to show a correlation between marital status and lung cancer. He said, "However, just as it is true that in the study of the statistical association of death rates and smoking,

cancer of the lung is not the only disease that exhibits the association, so here cancer of the lung is not the only disease that shows the relation with marital status." Then he showed that marital status was correlated with other cancers, and other diseases, just as for lung cancer.

He noted that while the death rate from lung cancer has been rising, death rates from all causes, among persons of the same age, have been decreasing and life expectancy is increasing. Stomach cancer death rates have fallen in the same period that the lung cancer death rate has increased, he said.

Lung, Stomach Cancers Decline

"If we consider deaths from cancer of the lung and cancer of the stomach together and the total population of males and females, there has been, instead of a precipitous increase, an over-all decline," Dr. Berkson said.

"To seize on one element of those secular changes—the rise of the death rate from lung cancer—attach to it what appears as a plausible explanation, and ride hard on this explanation, without relating it to other concomitant changes—this impresses one as the fallacy of misplaced concreteness in a fairly vicious form."

He cited a recent study by Dr. R. A. Willis reported in an Australian medical journal that said "the reported low death rate from lung cancer of decades ago was due to poor diagnosis, and that there probably has been no real increase of death rate from lung cancer at all."

Journal Questions

Cigarette Theory

There is now a "very formidable array of evidence, gathered from many quarters, which casts much doubt on the validity of the facile and much publicized hypothesis that cigarette smoking is an important cause of lung cancer," says an editorial in *Medical Proceedings*, published in Johannesburg, South Africa.*

"The attempt to blame everything on the cigarette has clearly been a vast over-simplification of a complex problem," the editorial said. "Many different etiological factors appear to be at work and scientific studies can only gain in value if they recognize the intricate variables involved."

The editorial discussed findings reported at an international conference on "Medical Aspects of Air Pollution," held last year in Vienna. Proceedings of the conference were published in the South African journal.

"The protagonists of cigarette smoking as a cause of lung cancer have steadily been forced to shift their ground and to recognize the importance (if not overshadowing importance) of air pollutants other than those due to cigarette smoke," the editorial said.

The editorial commented on conference reports showing an increase in cancer among various animals living in cities compared to those living in rural areas.

* "Do gay city dogs (*Genus Canis*) smoke too much?" Editorial, *Medical Proceedings*, Johannesburg, July 29, 1961.

Dr. Berkson on the "New Epidemiology"

"In recent years there has developed a fairly vigorous movement to determine the causes of disease by a search for statistical associations of death rates and particular physical factors. The movement is defined sufficiently well to have given itself a name. It is called the 'New Epidemiology.'"

"I have been following some of the writings of this school and am impressed with:

"1. The courage with which questions of the etiology even of diseases that have defied the best efforts of the greatest biologic investigators for generations are declared to have been

solved easily by the study of statistical associations—and without independent substantiation by biologic investigation.

"2. The practice of attending to the association of particular diseases with particular factors that appear etiologically plausible, while neglecting to note similar associations of the same disease with other factors and the same factors with other diseases—another variant of the fallacy of misplaced concreteness."

* "Difficulty of interpretation of the 'association' of death rates and physical factors." *Bulletin of the International Statistical Institute*, Paris, September 1961.

Lung Cancer Review

(continued from page 1)

cancer and tobacco consumption, the scientists said the "authenticity of death certificates for establishing the cause of deaths has been seriously questioned."

Lung Cancer Classification

It was not until 1939 that deaths diagnosed as resulting from lung cancer first appeared on death certificates, they wrote. From 1930-1938 lung cancer was tabulated with cancer and other malignant tumors of other respiratory organs.

Discussing experiments with tobacco smoke, they said "The neogenic effect on the respiratory tract has been negative following the inhalation of cigarette smoke in mice, rats, hamsters, rabbits and birds."

The two scientists also covered topics such as experimental production of lung cancer, problems in diagnosis and treatment of the disease.

Copies Available

A limited number of copies of the Rigdon-Kirchoff review are available. Address requests to: The Editors, Tobacco and Health, 150 East 42nd Street, New York 17, N.Y.

Campbell: Pulmonary TB

(continued from page 1)

Lung scars and chronic bronchitis frequently are caused by pulmonary tuberculosis, wrote Dr. Campbell, and there is evidence that both these conditions "are probably related to the development of lung cancer."

He also said "the tuberculosis process had often become of minor extent and was often inactive by the time the malignant disease developed. This suggests that any causal effect may be of a non-specific nature, rather than due to the specific influence of the tubercle bacillus."

His paper also reviewed studies by other scientists who reported a relationship between lung cancer and other chronic lung diseases.

Find Smoking Unrelated to Blood Fat Level

Two scientists report they found no association between tobacco smoking and the level of fatty substances in the blood of 221 pensioned men aged 65 to 85.*

The study found that older non-smokers have a higher level of serum cholesterol and other blood fats than smokers of like ages, reported Dr. Roy H. Acheson, senior lecturer in social and preventive medicine, Guy's Hospital Medical School and London School of Hygiene and Tropical Medicine, and Dr. W. J. E. Jessop, professor of social medicine at Dublin's Trinity College.

The researchers said "The lack of correlation between serum lipids and smoking habits in the present sample

receives indirect support from the fact that smoking does not seem to be associated with coronary heart disease in them or in two other samples of men over the age of 65 years."

They cited a 1961 paper by Dr. B. Bronte-Stewart who "believes the reason serum lipids are raised in younger smokers is because taste preferences induce them to eat more cholesterologenic substances, such as saturated fats, than non-smokers; he has published some evidence, which he does not claim to be conclusive, to support his view."

*"Tobacco smoking and serum lipids in old men." *British Medical Journal*, Oct. 28, 1961.

Smokers, Nonsmokers Have Same Cholesterol Levels

A New Zealand doctor studying cholesterol levels in 450 healthy, middle-aged men reports "no difference between the smokers and nonsmokers no matter how they were contrasted."*

Dr. J. D. Hunter, a physician and senior lecturer at the University of Otago, said his study was "in contrast" to surveys that have reported higher cholesterol levels in smokers.

He said "the mean level in non-smokers was found to be 248 mg./100 ml. contrasted to a mean of 244 mg./100 ml. in heavy smokers."

In his study on cholesterol, Dr. Hunter also found no association with diet, obesity, occupation, and physical fitness. He discussed measures to re-

duce high serum cholesterol levels, but noted that science is "awaiting conclusive data to support or deny the thesis that abnormal serum cholesterol is a principal causative agent in coronary artery disease."

He also said: "That acute emotional stress may often precede and often precipitate an acute myocardial infarction can seldom be denied by experienced physicians. However, the role of long-continued emotional stress in the etiological background of coronary disease remains an unknown quantity, defying accurate analysis as long as definition and measurement remain an obstacle."

*"Cholesterol and coronary disease." *New Zealand Medical Journal*, June 1961.

Heart Study: Four Characteristics

(continued from page 1)

"No significant differences were found," reported Drs. Sidney Pell and C. A. d'Alonzo of E. I. du Pont de Nemours & Company, Wilmington, Del. "There is no indication from our data that employees below the executive level exceed executives in quantity of cigarette smoking or in the prevalence of hypertension, overweight and hypercholesteremia."

As a result, they said, "we must search for characteristics other than those we have examined" to explain the differences in incidence of heart attacks between executives and non-executives. In their own studies, the scientists noted a "twofold excess" in incidence among nonexecutives.

Their studies were made among du Pont employees, who were classified into three groups: top level executives, other executives, and non-executives, or "blue collar" workers. Three differences were noted between the groups: Mean serum cholesterol of non-executives was slightly lower than that of executives; heavy cigarette smoking was proportionately more common in the lower level executive group than the two other groups; and proportionately more top executives have discontinued regular cigarette smoking than have employees in other job levels.

"None of these differences tends to explain the lower incidence of coronary heart disease among executives," they said.

NEW YORK POST
New York, New York
November 13, 1961

Study Shows Heart Disease, Lung Cancer Toll Near Peak

Detroit, Nov. 13 (AP)—Deaths mark the great epidemics and changing ways of the living—and now they may indicate that heart disease and lung cancer are nearing the peak of their deadliness, a scientist said today.

Dr. Reimert T. Ravenholt was a featured speaker at the opening session of the annual meeting of the American Public Health Assn. He told of a study of death records for the Seattle-King County area that went back some 85 years.

Recent records indicate that the death rates from coronary heart disease and lung cancer have ceased to increase for persons younger than 60 years of age, he said.

Newspaper Files Combed

They also indicate that "both these epidemics should reach a plateau or peak within 10 to 15 years," he said.

Dr. Ravenholt cited death

statistics based on official records and newspapers dating back to 1876, compiled with the aid of University of Washington students while he was at Washington.

The records for the Seattle area told the story of changing times through the changing ways in which men met their death, he said. He added:

"There is a wonderful history contained in old death records, a mute eloquence of earlier days: of stormswep Puget Sound and falling Douglas firs, of black damp (methane gas poisoning in mining) and cave-in, and of

the rush for gold in Alaska, and the accompanying misery of diphtheria, meningitis, syphilis and murder.

Some Ways They Died

"The records bear witness that people die in many, many ways: of 'execution by irate citizens'; of 'lockjaw from a firecracker'; of 'natural decay'; or by 'lighting fuse of dynamite placed on head.'

"The dead measured the quality of water and milk, and tested each new means of transportation. As they record changing ways of dying they speak eloquently of our changing ways of living."

DETROIT FREE PRESS
Detroit, Michigan
November 13, 1961

Theory On Cancer Disputed

The widely held belief that smoking causes lung cancer was pooh-poohed Sunday by a prominent New York chest surgeon before the annual post-graduate clinic of the Michigan general practitioners.

Dr. Milton B. Rosenblatt told the doctors that while the number of deaths from lung cancer has steadily risen in the last 30 years, the rate of increase has slowed. This despite the steady increase in smoking among Americans.

"The total number of deaths increased from 2,500 to 35,000 in 1960, but the rate of increase declined from 79 per cent to 33 per cent," Dr. Rosenblatt said.

In due time, the doctor predicted, the incidence of lung cancer will stabilize. The apparent epidemic was due primarily to the fact lung cancer has become more accessible to diagnosis within a relatively short span of years, he said.

THE PHYSICIANS also heard a report on the tremendous social handicaps faced by persons with epilepsy.

Dr. Madison H. Thomas, of

SOUTH BAY BREEZE
Redondo Beach, California
July 31, 1961

Cancer Caused By Smog, Virus

By BRYANT EVANS
Copley News Service

SAN DIEGO—Some mice were required to live in artificial smog or 24 hours a day.

Some others were exposed to virus.

Others enjoyed pure air.

But a fourth group was exposed to both the smog and the virus.

Its members rapidly developed lung cancer. Those in the other three groups developed little.

This experiment was described by Dr. Hans L. Falk, a University of Southern California biologist.

Lung Cancer

"At least in mice," he said, "the nitrogen and some other chemical irritating effects of a virus infection plus the cancerous effect of smog will produce lung cancer."

We can not be sure the same story will apply to man but there is no good reason to think the mice had to breathe the stuff 24 hours a day on a lifetime basis.

Falk was asked if there were any statistics to show that smog is causing an increase in lung cancer. He said that in Los Angeles, the concentration was higher than it ever gets in London.

in lung cancer in Southern California.

"Not yet," he said, "but we did not expect it. Our mice had lived nearly a lifetime before they developed cancer. For men the true sequel will not occur for 20 to 50 years. We haven't had sufficient exposure yet, but we are all working toward it."

He went on to point out that there were some unrealistic factors in his mouse experiment.

Clean Smog

In the first place, the laboratory smog was relatively clean — free of particulate matter and soot.

It was also free of oxides of nitrogen and some other chemical ingredients in the Los Angeles Basin brew. This made the laboratory product, if anything, less poisonous.

In the second place, however, there is no good reason to think the mice had to breathe the stuff 24 hours a day on a lifetime basis.

Besides, the concentration was higher than it ever gets in London.

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News Reports and Comment

The Tobacco Institute, Inc.
Washington 6, D.C.

December 1961

NEW YORK TIMES
New York, New York
September 8, 1961

MEDICAL TRIBUNE
October 9, 1961

SMOKING DOUBTED AS CANCER CAUSE

Mayo Doctor Declares Link
Is Unproved and Cites
Conflicting Statistics

PARIS, Sept. 7 (AP)—Dr. Joseph Berkson of the Mayo Clinic told a meeting of medical statisticians today they may be on the wrong track in linking lung cancer to cigarette smoking.

"I don't think we know anything about whether smoking causes lung cancer," he said. "Everything is tied up with everything else. We still need to know very much more about the background, environment, diet and medical history for victims of all diseases."

Dr. Berkson, of the biometry and medical statistics section at the Rochester, Minn., clinic, spoke before the International Statistical Institute.

He said a scientific study in England showed the incidence of lung cancer rose in relation to cigarette consumption.

Finds Many Interrelationships

Another study in the United States gave graphic evidence that smoking causes death from coronary heart disease, he said. The chart line rises at almost the same rate as for the cigarette-lung cancer study.

Dr. Berkson asserted that still another study with appropriate graphs indicated that degenerative heart disease was closely linked to fat consumption. And in a study of his own, Dr. Berkson showed a connection between degenerative heart disease and protein consumption.

"My point is," Dr. Berkson said, "that heart disease may be aggravated by smoking, by fat consumption, by protein consumption—the statistics are there to prove any case—but it is dangerous to pick out one cause and say that is the only one. There may still be many others. There are too many interrelationships."

The New Epidemiology

ALL THAT IS NEWER is better, and indeed bigger and better, so that if Joseph Berkson, of the Mayo Clinic, refers to a "new epidemiology" it is chastening to learn that he means an old game called the fallacy of misplaced concreteness. This species of epidemiology has come into being through the manhandling of statistics—for example, the manhandling that gave rise to the incrimination of smoking as "a cause of lung cancer"—and it is well to take account of Berkson, who is a distinguished student of (real) statistics.

In brief, smoking cigarettes cannot be shown to cause any sort of cancer by means of statistics, because it has not been shown by the more usual biologic means of showing things. Admittedly the latter is more trouble. But Berkson deals with this fallacy in a happy, devastating footnote (in the *Bulletin de l'Institut International de Statistique*, 33^e session, Paris, 1961) by quoting de Morgan in regard to Bacon's *Novum Organum* thus:

"Bacon's ruling idea was the collection of enormous masses of facts . . . so artistically contrived, that a man . . . without unusual sagacity, should be able to announce the truth sought for." An advantage of the method is that, for example, to discover the cause of cancer one is not compelled to be possessed of any

knowledge about the subject or to indulge in cumbersome and sometimes perplexing experimentation.

"Courage" is the name given to solving (or imagining one has solved) difficult questions of etiology merely by numerical associations; misplaced concreteness is the mistake of identifying some attractive associations between diseases and putative causes, and remaining oblivious to any number of other associations—and a pity, because they are often still more amusing. Thus, what is claimed to be the relation between smoking and lung cancer fails to take account of, say, the contrast between married and divorced people, the married ones having a lower mortality from lung cancer and heart disease and cancer of the stomach. The well-known comforts of home thus would presumably include a meager, nonfat diet, no smoking, and an absence of those cancer-exciting viruses that are "stimulated by divorce." (But the reverse may be true, as Berkson points out. Divorce may be caused by viruses.)

The moral is that statistics might often "locate suggestions" for scientists to work on; but it is an unfortunate delusion, suitable for the naive general public, that they can assert answers to a problem not yet enough investigated. Berkson politely refrains from supposing us as naive as that.

UNION
San Diego, California
September 24, 1961

● Cancer Theory Challenged

PRETORIA, South Africa — Although white South Africans rank among the heaviest cigarette smokers in the world, the chance of their contracting lung cancer is less than half that of smokers in the more industrialized and smog-ridden cities of Europe, says Reuters. This information is contained in a report on medical research into the incidence of lung disease published in the "Journal of Medical Proceedings," says the report: "The attempt to blame everything on the cigarette has clearly been a vast oversimplification of a complex problem. The protagonists of cigarette smoking as a cause of lung cancer have steadily been

forced to shift their ground and to recognize the importance (if not the overshadowing importance) of air pollutants other than those due to cigarette smoke." To support this theory Dr. Geoffrey Dean, who was in charge of the research carried out in South Africa, cited the fact that the incidence of lung cancer in South Africa is less than half that of Britain, although South Africans break all records in their craving for cigarettes, smoking an average of 32 a day. He also pointed out that Durban, which suffers from a "serious air pollution problem," has the highest incidence of cancer in South Africa with double the rate of Johannesburg or Capetown.

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